DOCUMENT RESUME

ED 256 070 EA 017 704

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TITLE Competing for Quality: An Analysis of the Comparability of Public School Teacher Salaries to Earning Opportunities in Other Occupations. Occasional Papers in Educational Policy Analysis. Paper No. 415.
INSTITUTION Southeastern Regional Council for Educational Improvement, Research Triangle Park, N.C.
SPONS AGENCY National Inst. of Education (ED), Washington, DC.
PUB DATE Apr 85
GRANT NIE-G-83-0076
NOTE 34p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Comparative Analysis; Demography; Economic Research; *Educational Economics; Elementary Secondary Education; Employment Opportunities; Employment Patterns; *Labor Market; Multiple Regression Analysis; *Public School Teachers; Regression (Statistics); *Salary Wage Differentials; Statistical Analysis; Teacher Employment; Teacher Persistence; *Teacher Salaries; Teacher Supply and Demand; *Teaching (Occupation)
IDENTIFIERS *United States (Southeast)

ABSTRACT

This paper describes an initial effort to provide a carefully reasoned, factually based, systematic analysis of teacher pay in comparison to pay in other occupations available to college-educated workers. It also reports on the sensitivity of these salary comparison estimates to differences in certain characteristics of the labor force, such as sex, age, marital status, and ethnic identity. The data, derived from the individual record file of the March 1983 Current Population Survey of the United States Bureau of the Census, consisted of observations of college-educated salaried workers in the 12 southeastern states: 3,383 nonteachers and 373 public school teachers. Primary analysis of data provides comparisons of average annual wage between teachers and nonteachers, personal characteristics of the two groups, and comparison of average annual teacher salaries for 1981-82 and 1982-83. A regression equation is then used to relate annual earnings of college-educated workers in nonteaching occupations to various independent variables. Results of the analysis show that current teacher pay levels are inadequate to compete with other occupations. Suggestions are made as to the specific salary ranges within which competitive teacher salaries might lie. References are included, along with six illustrative tables. (TE)

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The activity which is the subject of this paper was supported in whole or in part by the National Institute of Education, Department of Education. However, the opinions expressed herein do not necessarily reflect the position or policy of the National Institute of Education, and no official endorsement by the National Institute of Education should be inferred.

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Competing for Quality: An Analysis of the Comparability of Public School Teacher Salaries to Earning Opportunities in Other Occupations

Teachers are not paid enough. This statement has been repeated in every task force report, public commentary, and policy discussion of the past two years as our nation has tried to explicate and remedy the general perception of a crisis in education. Beginning with A Nation at Risk and continuing through the most recent feature in the Sunday supplement, the line of reasoning employed has been simple, direct, and remarkably uniform: Students are learning less than they need to learn for success in a competitive world. Students are learning less because teachers are less academically competent than they need to be (or used to be). Teachers are less competent because the most capable individuals are leaving or never entering the field. Capable individuals are leaving or never entering teaching because the earning opportunities in other occupations are much better than earning opportunities in classroom teaching. Therefore, to get better teachers into the classroom who will increase the chances of students' learning more of whatever they need to succeed in this competitive world, it is necessary to raise teacher salaries to a level that is comparable to the salaries that academically competent people can earn in other occupations. Various reports include other causes besides poor pay in their lists of factors contributing to the decline of America's public schools, but in every list low teacher pay and the influence of low pay on teacher work-force quality have been given a prominent position. Improved teacher salaries have been identified repeatedly as the central element in strategies to remedy the current "crisis" in American education.

Given the emphasis that has been placed upon raising teacher salaries, it is important that education researchers and policy makers carefully and

systematically attempt to answer the question, "How much?" While a voluminous literature exists that addresses the importance of adequate teacher pay as a generic issue, there has been surprisingly little work that attempts to determine empirically what an adequate salary range would be. This paper reports the results of research that offers an answer to that question.

The approach used in this paper is to compare teacher salaries to salaries in other occupations. The concept of paying teachers a salary comparable to earning opportunities in other occupations will be familiar to persons who have followed the recent literature of the teacher pay issue. It underlies Weaver's analysis of the apparent decline of academic quality of teachers (Weaver, 1983). The idea that teacher salaries must be competitive with other opportunities was expressed by Feistritzer in her 1983 study of teachers (Feistritzer, 1983). The need to increase teacher salaries competitively with opportunities in other sectors was expressed by Darling-Hammond in the recent Rand Corporation report (Darling-Hammond, 1984).

Maintenance of a competent teacher work force requires that earning opportunities in the profession be comparable to those in competing occupations. Economic theory clearly establishes that any resource will tend to flow toward the more highly remunerated use, other things being equal. That proposition applies to human labor resources just as it does to other kinds of productive resources. The difficulty in applying the proposition arises because the "other things" that enter the economic calculus seldom are equal between two alternative occupations. This is especially likely to be so in the complex area of human resource allocation decisions that are strongly influenced by tastes, preferences, expectations, and social custom. The economic comparisons involve a large element of subjective value

judgments by the decision makers. It is easy to say "make teacher pay comparable to other fields." The hard job of policy analysis is to define the terms of comparison, to identify the basis of comparison, and to discover factual data upon which to base a comparison.

This paper describes an initial effort sponsored by the Southeastern Regional Council for Educational Improvement to offer to education policy makers in the Southeast a carefully reasoned, factually based, systematic analysis of teacher pay in comparison to pay in other occupations. This is described as an initial comparison because the task of conducting such analysis and adopting teacher compensation policies to make teacher pay competitive with other occupations can never be a one-time activity. Since the economic conditions of the nation and the region are constantly changing, the task of monitoring teacher work-force conditions, and especially pay comparability, must be conducted continuously. The data, the methods of analysis, and the conclusions of pay comparability analysis should be updated annually to ensure that the teaching occupations attain and maintain the ability to attract competent and skilled individuals in competition with other occupational alternatives. Only by continual analysis of the market and appropriate adjustment of policies can education break out of the pattern of recurring cycles of supply crises that have characterized the occupation for the past eighty years (Weaver, 1984). Although the analysis reported here is specifically applicable to the twelve-state region served by the Southeastern Regional Council, the methods and data sources may be easily extended to other regions or to the nation as a whole.

The first step in conducting a pay comparability analysis is to ask the following question: Based on a set of relevant characteristics describing the persons presently employed as teachers, what annual salary could such

persons earn on average in alternative occupations that might be open to them? The comparison should not be to any particular alternative occupation, but to a composite of the variety of alternatives that are available. Since teaching is a field that draws upon a broad array of skills and abilities (the requirement for a college degree is the only clear-cut common denominator), the appropriate basis for comparison is the composite of employment opportunities for all college-educated workers. Since cost-of-living and labor market conditions vary regionally, the basis of comparison for this study was limited to alternative earning opportunities for college-educated workers in the twelve Southeastern Regional Council member states.

The research question, "What annual salary could the typical teacher earn in a nonteaching job held by the average college-educated person?" is only the first step. It provides a basis for comparison, but does not define specifically what a proper or "competitive" teacher salary ought to be. That ultimate determination requires adjustment of the figure found as the initial basis of comparison to account for the positive and negative non-pecuniary rewards of teaching in comparison to other fields. That adjustment involves consideration of the value of leisure time, job security, work conditions, fringe benefits, etc. A policy maker considering adoption of a teacher pay plan should also ask whether the existing work force is in fact the work force which the public wishes to retain and reproduce. If the desire is to develop a work force with different characteristics, then the pay comparability analysis should be conducted with reference to the alternative earning opportunities of the group of persons with the desired characteristics, rather than with reference to the present work force.

In this report, no attempt is made to estimate systematically the values that should be imputed to leisure time, work conditions, fringe benefits, job

security, and other attributes that differentiate teaching from other occupations. The investigation of the imputed values for such attributes should be undertaken to support rational teacher salary policy decisions, and research involving at least some of those issues is underway as part of the Southeastern Regional Council's continuing teacher labor market research project. The object of the research reported in this paper is only to determine the benchmark or initial basis for comparison. This paper will also report the sensitivity of the salary comparison estimate to changes in some characteristics of the labor force in question. Of particular importance is the sensitivity of comparable pay to the male/female composition of the labor force. That sensitivity analysis should be useful to policy makers who are concerned with developing a teacher work force with different characteristics from the present one.

The data used for this analysis was found in the individual record file of the March 1983 Current Population Survey of the U. S. Bureau of the Census. The total file consists of a representative sample of the U. S. civilian population between the ages of 17 and 65. The total data set contains approximately 180,000 observations. Each observation record contains information regarding employment status, education, occupational category, earnings, age, place of residence, other persons in the household and their employment and earnings, and sociodemographic variables for an individual. The file was read to extract all observations of college-educated (two or more years) salaried workers residing in the twelve Southeastern Regional Council member states (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia). Self-employed workers were not included because the earnings of such individuals often include a

remuneration for capital as well as labor and so would be inappropriate for a comparison to teacher salaries. Persons who did not work during the previous twelve months (whether voluntarily or involuntarily) were excluded from the data set. Since the data contained information regarding hours and weeks worked that could be used in the analysis, part-time workers were not excluded. Altogether, 3,800 records were compiled and analyzed. The observations were partitioned between persons in occupations other than teaching (3,383) and public school teachers (373). Observations of 44 private school and private kindergarten teachers were excluded.

The current population survey data shows that among college-educated workers in the Southeast who were in nonteaching occupations, the average wages earned during the twelve months previous to March 1983 totaled $19,707 with a standard deviation of $15,129. The minimum annual earnings value among the 3,383 observations was $1, and the maximum value was $75,000. The standard error of the mean was reported as $258.08. It is important to note that since part-time workers are included, the mean is lower than it would have been if only full-time workers had been included. (Elimination of the 843 observations reporting either less than 30 hours per week average work or less than 40 weeks worked in the previous year raises the average wage earnings amount for nonteachers to $20,927.) The regression analysis on the nonteacher data, described below, controlled for weekly hours worked and weeks worked per year. For the 373 teachers in the sample, the average wage earnings during the twelve months prior to March 1983 were $14,145 with a standard deviation of $6,663 and a standard error of the mean of $345. The maximum teacher earnings value was $38,500, and the minimum reported amount was $30. The observations included some public school teachers who were part-time workers (substitutes, part-day kindergarten and preschool program

teachers, practice teachers) and some full-time teachers in March 1983 who had only worked part of the previous twelve months (e.g., May 1982 resignations and September 1982 or later new appointments). When the 116 observations of public school teachers reporting average work weeks of less than 30 hours or annual weeks worked of less than 40 were excluded, the mean wage earnings increased to $16,793 with a standard deviation of $3,129 and a standard error of the mean of $297. For the 257 observations that may be described as "full-time teachers" for the year prior to March 1983, the minimum earnings reported were $10,500, and the maximum was $38,500.

Among the nonteacher group (3,383 observations), 60.2 percent were male, and 39.8 percent were female. Among the public school teachers (373 observations), 20.4 percent were male, and 79.6 percent were female. The racial composition of the nonteacher group was 88.6 percent white, and the teacher sample was 79.6 percent white. The average age of the nonteacher sample was 36.7 years, and the average age of the teacher sample was 38.3 years. The descriptive statistics for the two groups are summarized in Table 1.

After allowing for the effect of part-time and part-year teachers in the sample, the earnings amounts reported for teachers in the Current Population Survey (mean of $16,793 for teachers working 30 or more hours per week and 40 or more weeks per year) seem consistent with the reports of statewide average teacher salaries derived from state departments of education records. Since the Current Population Survey data, referring to earnings for the twelve months prior to March 1983, span parts of two school years, it is impossible to compare the CPS data to a single school year average salary report. However, the average teacher salary amounts reported from state departments of education data for the 1981-82 school year and for the 1982-83 school year

TABLE 1

Summary Statistics for Southeastern States
College-Educated Workers March 1983 Current Population Survey

	Mean of Sample	Standard Deviation	Standard Error of Mean
All Nonteaching Salaried Workers			
Wages income	$19,707	15,010	258
Age	37.7	10.9	.19
Education in years (K=1, College B.A.=17)	16.3	1.6	.03
Average weekly hours	40.4	14.4	.25
Percent married	68.0%	47.5%	0.80%
Percent male	60.2%	49.0%	0.80%
Percent white	88.6%	31.8%	0.50%
Public School Teachers			
Wages	$14,145	6,663	345
Age	38.3	10.2	0.53
Education	17.7	1.2	.06
Average weekly hours	37.8	12.1	1.15
Percent married	73.0%	.46%	.04%
Percent male	20.0%	.49%	.05%
Percent white	79.0%	.40%	.04%

Source: U.S. Bureau of Census, March 1983 Current Population Survey, individual records tape.

(NOTE: THE ABOVE INCLUDES PART-TIME AND FULL-TIME WORKERS)

fall below and above the mean earnings of $16,793 for "full-time" teachers in the CPS sample. According to one source, the average annual teacher salary for the twelve southeastern states in the 1981-82 school year was $16,302, and the mean for the 1982-83 school year was $17,462 (American Federation of Teachers Research Report, 1984). Table 2 below shows the reported average annual teacher salaries by state for each of the school years. The table is based on the data collected for the American Federation of Teachers' research report from state education agency sources.

TABLE 2

Average Annual Teacher Salaries for 1981-82 and 1982-83

State	1981-82	1982-83
Alabama	$15,600	$17,900
Arkansas	$14,501	$15,029
Florida	$16,780	$18,538
Georgia	$14,978	$15,900
Kentucky	$17,294	$18,384
Louisiana	$17,930	$18,400
Mississippi	$14,135	$14,320
North Carolina	$16,614	$17,801
South Carolina	$15,615	$16,430
Tennessee	$16,582	$17,697
West Virginia	$17,129	$17,322
Virginia	$17,009	$18,535
Southeast Region Composite	$16,303	$17,463

Source: 1983 Salary Trends for Teachers: Survey and Analysis. Washington: American Federation of Teachers, 1984.

To develop an estimate of the alternative earning opportunity for teachers, the observations of nonteachers in the sample (3,383 observations) were analyzed using a multiple regression procedure. The multiple regression technique was chosen because it would produce a reasonably straightforward and easily interpreted mathematical relationship between predicted earnings and a set of descriptive variables. It was felt that a multiple regression equation would be more readily applied to the sensitivity analysis and to the

development of alternative salary scale policies than would the results of other types of statistical analyses. The object of the analysis was to explain the earnings of individuals in terms of a set of variables that could be related to descriptors of the teacher labor force. The characteristics of the teacher work force (existing or desired) can be defined in terms of values of the explanatory variables in the wage regression model. When the variable values describing the teacher work force are substituted into the estimated regression equation, the result is a dollar amount that may be interpreted as the expected mean annual earnings for an individual with the described characteristics working in the general labor market for college-educated workers in the Southeast region. Based on the CPS data as a representative sample of workers in the Southeast, the model in effect produces a composite picture of earning opportunities in the various specific occupations. The earnings associated with each occupation are represented in the composite earnings amount in the same proportion (inferred from the sample) as that occupation employment level is related to total employment of college-educated workers. Because the teacher work force is very large and requires a broad range of education and skills, it seems more appropriate to compare teacher earnings to a composite for the earning opportunities for college-educated workers, rather than to one specific occupational alternative In the event that policy makers wish to construct differentiated teacher pay plans for various teaching specialties, it would be appropriate to conduct the earnings comparison in terms of narrower definitions of alternative occupations. The method employed in this research and the CPS data resource contains sufficient detail to support such analysis. The estimates of earnings are based on data in the March 1983 CPS and represent earnings for the twelve months prior to March 1983. Inflation

of prices and wages has continued since that time. Based on the average of the GNP implicit price deflator for the year prior to March 1983 and the value of the most recently available month, it is estimated that an upward adjustment of no more than 7 percent would update the estimates to November 1984 equivalents.

The multiple regression analysis of the 3,383 observations of nonteaching college-educated workers was conducted using annual wage earnings as the dependent variable and the following independent variables: (1) education in years, (2) work experience in years, (3) total number of weeks worked during the previous twelve months, (4) sex, (5) race, (6) marital status, (7) average hours worked per week during past twelve months, and (8) location of the workers in terms of the central city of a standard metropolitan statistical area (SMSA), a suburban county within an SMSA, or a county not in an SMSA.

The variable education in years is defined on a scale that defines kindergarten as "1." Therefore, a twelfth-grade high school education corresponds to 13 years of education in the CPS data, and completion of four years of college is entered as 17. Since completion of a degree program may have an effect on earnings in addition to the effect of the number of years of education, a second education variable was derived to capture some of the degree status effect. That second variable, denoted "Colled" in the model, was defined as 0 for individuals with less than 17 years of education and as 1 for individuals with more than 17 years of education reported in the CPS observation. The variable denoted as experience may be considered a misnomer; it is may be more accurately described as age-adjusted for education, which is a proxy for an individual's potential experience, but not a direct measure of experience. That variable was defined from the CPS

sample observations as age minus education in years minus five. The square of the "experience" variable was also included in the model to allow for a possible nonlinear relation between earnings and age/experience.

Several alternative specifications of the model were attempted. The initial versions of the model included several additional variables that were eliminated because of high multicollinearity with several of the remaining variables. The specification of the model reported here has reduced, but not eliminated, the problem of multicollinearity. The model which seemed to fit the data best was one that expressed the logarithm of annual earnings as a linear function of the independent variables. The estimated equation is a reduced-form specification which explains the equilibrium annual wage in the market for college-educated workers in the Southeast as a function of variables derived from implied underlying market supply and demand functions. The underlying model of labor demand is seen as deriving a demand price based on employers' perceptions of marginal product of labor. It is assumed that key variables determining perceived marginal product of labor include experience (age), education, sex, race, and marital status. The workers' immediate past work history (hours and weeks worked) and locational considerations may also affect perceived marginal product. The underlying model of labor supply is seen as deriving a supply price of workers as a function of age, sex, marital status, race, the time pattern of available work, and locational considerations. The estimated reduced form equation is shown in Table 3. The R2 statistic for the regression was .67.

When variable values denoting the demographic characteristics of the average teacher in the CPS sample are substituted into the equation, the predicted full-time annual earnings equivalent amount is $17,893. That amount is only slightly above the actual average teacher pay amount for the

CPS sample ($16,793) and the average teacher salary in the region reported from state records sources for the 1982-83 school year ($17,462) (Ward and Gould, 1984). The low level of predicted earnings alternatives for teachers is the difference in the sociodemographic characteristics of the teacher work force compared to the nonteacher work force of college-educated persons. The teacher work force is less male (20 percent compared to 60 percent), less white (79 percent compared to 89 percent), and less urban (44 percent compared to 60 percent) than the nonteacher work force. These factors reduce the predicted earnings of the teacher group in nonteaching alternative occupations despite the fact that teachers are slightly more educated than nonteaching workers. One of the facts about the U. S. labor market is that nonmale, nonwhite, and nonurban workers have lower earning opportunities than male, white, urban workers with the same experience and education. The predicted amount, $17,893, is a full-time salary alternative: It is derived by assuming a 52-week work year. If the actual average teacher work year of 45 weeks is substituted in the model, the predicted earnings alternative falls to $15,118. Clearly, the way in which a salary policy adjusts for the length of the work year is of critical importance. This issue will be examined in detail subsequently.

The model developed for this paper indicates that teachers may be receiving salaries reasonably comparable to their nonteaching alternatives when viewed in the context of the sociodemographic characteristics of the existing teacher work force. However, that comparison may be inappropriate if the presence of sexual or racial discrimination (in pay and in employment opportunity) in other occupations has contributed to the higher proportion of females and nonwhites in teaching. Education policy makers must consider that question in order to choose an appropriate basis for salary comparison.

Table 3

Regression Equation Relating Annual Earnings of College-Educated Workers in Nonteaching Occupations to Various Independent Variables

$$\begin{aligned}\text{Ln(Wage)} = {} & 4.690499 + .027274*\text{EDUCYEARS} + .031647*\text{EXPER} \\ & +.049476*\text{WEEKWKD} + .307948*\text{SEX} + .097077*\text{RACE} \\ & +.120117*\text{MARRIED} + .164076*\text{SUBURB} + .079096*\text{INCITY} \\ & +.031052*\text{HOURWKD} + .154125*\text{COLLED} - .0005*\text{EXPERSQR}\end{aligned}$$

Where

Ln(Wage) = the natural logarithm of annual wage earnings

EDUCYRS = education in years beginning with K=1

EXPER = age minus EDUCYRS minus five

WEEKWKD = total weeks worked during twelve months prior

SEX = value of 0 denoting female, value of 1 denoting male

RACE = value of 0 denoting nonwhite, value of 1 denoting white

MARRIED = value of 0 denoting not married, value of 1 denoting married

SUBURB = value of 0 if respondent not a resident of suburban county of SMSA, value of 1 if respondent is resident of suburban county of SMSA

INCITY = value of 0 if respondent not a resident of central city of SMSA, value of 1 if respondent is a resident of central city of SMSA

HOURWKD = average hours worked per week previous twelve months

EXPERSQ = the square of the value of the variable EXPER

If one adopts the sociodemographic characteristics of the nonteaching labor force (60 percent male, 89 percent white, and 60 percent urban) as the basis of comparison, but adopts the education (17.67 years) and age/experience characteristics of the teacher work force, the comparable earnings amount is $20,895. The interpretation of that figure would be that

a person with the education and age/experience characteristics of the typical teacher, but with other sociodemographic characteristics typical of the nonteaching work force, would be able to earn an expected annual salary of $20,895 in a full-time (52 weeks) nonteaching occupation. That amount is an increase of over $3,000 per year above the reported regional average salary for teachers in 1982-83. If the basis of comparison were changed to reflect earning opportunities on a male-only basis (holding other characteristics constant), the comparable earnings amount would be $23,640. Table 4 below

Table 4

Expected Full-time Earnings of College-Educated Workers in NonTeaching Occupations in the Southeast, 1983 Derived from Regression Equation Described in Table 3

Case A: Based on mean characteristics of existing teacher work force	$17,793
Case B: Based on mean education and experience of existing teacher work force and mean sex, racial, and urban residence characteristics of nonteaching work force	$20,895
Case C: Based on mean education and experience of existing teacher work force, mean racial and urban residence characteristics of nonteaching work force, and assumption of 100% male group	$23,640
Case D: Based on mean education and experience of existing teacher work force, mean urban residence characteristics of nonteaching work force, and assumption of 100% white male comparison group	$23,889

summarizes the predicted earnings of persons in teaching occupations in the Southeast based on the various sociodemographic bases of comparison discussed here.

The above figures indicate that unless education policy makers ascribe to extremely high estimates of the value of the net nonpecuniary benefits of

the teaching occupation (summer vacation time, job security, working conditions, etc.), the task of making teacher salaries comparable to and competitive with the nonteaching earning opportunities for workers in the Southeast will require a significant commitment of additional resources to teacher pay. The alternative is for teaching to be perceived as a less attractive occupational alternative to persons entering colleges and choosing courses of study that commit them to certain occupational tracks. Such an alternative would contribute to a continuing decline in the quantity and academic quality of persons entering the teacher market. Only the comparison based on replication of the sociodemographic characteristics of sex and race in the teacher labor market presents a comparison amount close to current salary levels. Adopting that basis of comparison for policy purposes would place education agencies in the untenable position of either denying the existence of a history of sex and race discrimination in southeastern labor markets or of exploiting the effects of such history. In any event, the present trend toward erasing those sex- and race-linked earning opportunity disadvantages will eventually raise the alternative earning opportunities for teachers regardless of the sociodemographic basis used for the analysis. This consideration is particularly important for setting salary levels that will be attractive to new labor market entrants. Today's college student, regardless of sex or race, is more likely to look at the white male earning opportunities in choosing an occupation than in the past.

It is not the intent of this report to specify what <u>the</u> correct salary level for teachers might be. Indeed, the major conclusion of this research has been that salary competitiveness is a matter of degree, not absolute right or wrong. Some very competent individuals will choose to enter teaching even at very low salary levels because they place high personal

values on the nonpecuniary rewards and benefits of the occupation. Higher salaries increase the probability that the quantity and quality of persons entering the field will increase. That probability is hypothesized to increase continuously as salary is varied upward. The rightness of any particular salary level also depends on the value judgments of education policy makers regarding the size and quality of teacher work force that is necessary to achieve their vision of society's educational goals. The conclusion that emerges from this research, then, can only be expressed as a range of salary options for teacher pay.

The lower bound of that range is the amount $15,118. This is the average salary which emerges when the characteristics of the existing teacher work force, including a work year of only 45 weeks per year, are substituted into the pay comparability model. This amount is below the actual average teacher salary for 1982-83 in all but two of the twelve southeastern states. (The exceptions are Arkansas and Mississippi.) The upper bound of the range of competitive salaries is the amount $23,889 that emerges when the characteristics for a 100 percent white, male, 52-weeks-per-year work force are substituted into the pay comparability model. In both cases, reference is to comparability for average teacher salaries. The average salary level in question can be influenced by policy decisions influencing the age and experience structure of the teacher work force. The lower and upper bound estimates reflect the assumption of a work force of average age 38.25 and average 16.5 years work experience. These figures reflect the actual age and imputed experience of the existing teacher work force in the Southeast. The lower and upper bound comparable amounts are estimates of what similar-aged and experienced persons with college degrees could earn in nonteaching salaried occupations in the Southeast. If education hiring and retention

policies were to result in a teacher work force with a younger average age, then the range for comparable average salary would be lower. If policies were to result in an older average age for teachers, the comparable salary range would be higher.

The lower bound comparison amount ($15,118) is noteworthy because in ten of the twelve states, teacher salaries are already above that level. In terms of the basis for comparison used to compute the lower bound estimate, teacher salaries are currently "competitive" with other alternatives. The problem for education policy makers is that the basis for comparison in the lower bound case is part-time work. Current teacher salaries do compare favorably to other opportunities for part-time work. The question that education policy makers must answer is whether the pool of persons oriented toward part-time work opportunities is the group from which they wish to draw the teacher work force. Comparable earnings estimates are very sensitive to the hours worked and weeks worked variables. If the age, sex, and education characteristics of the existing teacher work force are held constant in the model, but the weeks worked variable is increased to 52, the estimate of comparable earnings rises to $20,314. A 15 percent increase in weeks worked is associated with a 34 percent increase in comparable earnings. This difference suggests that full-time workers and part-time workers are competing in separate labor markets. If comparison is made to the 52-weeks-per-year opportunities of college-educated workers, teacher salaries do compare unfavorably. This situation makes determination of the worth of the extra leisure time offered to teachers critically important. How much income are workers willing to forgo in return for the shorter work year of teaching and still find the income from teaching comparable to the 52-weeks earning alternative? The amount of $20,314 derived as the 52-weeks earning

opportunity for persons with educational and demographic characteristics of the existing teacher work force represents $391 per week. That weekly amount is the upper limit on the amount of income that an individual would sacrifice in exchange for each week of reduced work obligation. If, as economic theory postulates, leisure time is subject to the principle of diminishing marginal utility, the actual amount that an individual would sacrifice would be less than $391 per week. The amount would get smaller with each successive week of work-year reduction. Therefore, to attract persons who might otherwise choose nonteaching occupations offering a 52-weeks-of-work commitment, schools offering only 45 weeks per year of work commitment would need to pay no less than $17,595 in order to be marginally competitive. To offer an average salary of less would place the schools in the posture of primarily attracting workers who preferred part-time over full-time work. Such a posture would constrain the potential teacher work force in terms of both quantity and quality.

The analysis thus far has addressed only the question of average teacher salary levels. The average teacher salary emerges in practice from the way in which the actual teacher work force fits into a set salary schedule which reflects (typically) education and experience. The regression model developed here can be used to infer a competitive full-time equivalent starting salary and salary schedule based on education and experience variations. It is not possible to incorporate merit concepts directly into this model, but the results in terms of experience and education variation requirements for competitive pay may be suggestive of appropriate parameters for merit pay schedules.

To illustrate the range of competitive beginning salaries and salary schedules that emerge from different specifications of teacher work-force

characteristics, two alternative specifications are shown in Tables 5 and 6. Table 5 shows the case based on a assumption of a strictly female labor force--implying that teacher salaries are set only to compete with the earning opportunities of the female labor force. The inferred starting salary is $13,418, close on the low side to present teacher starting salaries in the region. The age/experience schedule of salary variation in this case also closely parallels existing teacher salary trends. This result supports the conclusion that public school systems have been effectively maintaining competitive teacher salary levels in the limited context of the female-only labor market. Schools have been able to successfully offer low salary levels because they benefited from the sex discrimination that characterized the general labor market. The challenge facing education policy makers today is to seek a new teacher pay comparability strategy to fit a market in which the results of a history of sex discrimination may be disappearing.

Table 6 shows a case that should be considered as the upper limit on the range of starting salary and competitive salary schules. It shows the earnings comparison for a strictly white male specification of the equation. That case implies a starting salary level of $18,258 and a salary schedule which increases to $29,241 at the top of the experience and education spectrum. As with the previous case, this represents full-time earnings equivalent amounts. Some adjustment for nonpecuniary benefits of teaching in comparison to other occupations may be possible while still maintaining competitiveness with occupational alternatives.

Table 5

Southeastern Educational Information System
Expected Earning Opportunities for
College-Educated Workers - 1983

Variable	Value	
Years of Education	17	(K = 1, B.A. = 17, Ph.D. = 21)
Experience	0	(Age minus education years minus five)
Weeks Worked	52	(Annual weeks worked)
Sex	0	(Female = 0, male = 1)
Race	1	(Nonwhite = 0, white = 1)
Married	1	(Single = 0, married = 1)
Suburb	1	(1 = Living in noncentral-city part of classified)
Incity	0	(1 = Living in central-city part of classified SMS)
Hours Worked	40	(Average hours worked per week for past year)
College	1	(= Degree holder, 0 = no college degree)
Experience	0	
Predicted Annual Earnings	$13,418.42	

Salary schedule based on beginning teacher characteristics assumed above and experience/education adjustments for competitiveness with nonteaching occupations.

TABLE 5 (continued)

Years of Experience	B.A. only	B.A.+1	B.A.+2	B.A.+3	B.A.+4
0	$13,418.42	$13,789.44	$14,170.70	$14,562.51	$14,965.16
1	$13,842.05	$14,224.77	$14,618.07	$15,022.25	$15,437.61
2	$14,262.91	$14,657.28	$15,062.54	$15,479.01	$15,906.99
3	$14,679.98	$15,085.88	$15,502.99	$15,931.64	$16,372.14
4	$15,092.18	$15,509.47	$15,938.30	$16,378.98	$16,831.85
5	$15,498.44	$15,926.96	$16,367.33	$16,819.87	$17,284.93
6	$15,897.65	$16,337.21	$16,788.92	$17,253.13	$17,730.17
7	$16,288.73	$16,739.11	$17,201.93	$17,677.55	$18,166.33
8	$16,670.59	$17,131.52	$17,605.19	$18,091.97	$18,592.20
9	$17,042.13	$17,513.33	$17,997.56	$18,495.18	$19,006.56
10	$17,402.27	$17,883.43	$18,377.90	$18,886.03	$19,408.22
11	$17,749.96	$18,240.73	$18,745.08	$19,263.37	$19,795.99
12	$18,084.15	$18,584.16	$19,038.00	$19,626.05	$20,168.69
13	$18,403.82	$18,912.67	$19,435.59	$19,972.97	$20,525.21
14	$18,707.99	$19,225.25	$19,756.82	$20,303.08	$20,864.45
15	$18,995.71	$19,520.93	$20,060.67	$20,615.34	$21,185.34
20	$20,157.51	$20,714.85	$21,287.60	$21,876.19	$22,481.05
25	$20,794.56	$21,369.51	$21,960 36	$22,567.55	$23,191.53
30	$20,854.23	$21,430.83	$22,023.38	$22,632.31	$23,258.08
35	$20,331.54	$20,893.69	$21,471.39	$22,065.06	$22,675.14
40	$19,269.83	$19,802.63	$20,350.16	$20,912.83	$21,491.05

TABLE 6

Southeastern Educational Information System
Expected Earning Opportunities for
College-Educated Workers - 1983

Variable	Value	
Years of Education	17	(K = 1, B.A. = 7, Ph.D. = 21)
Experience	0	(Age minus education years minus five)
Weeks Worked	52	(Annual weeks worked)
Sex	1	(Female = 0, Male = 1)
Race	1	(Nonwhite = 0, white = 1)
Married	1	(Single = 0, married = 1)
Suburb	1	(1 = Living in noncentral-city part of classified SMS)
Incity	0	(1 = Living in central-city part of classified SMS)
Hours Worked	40	(Average hours worked per week for past year)
College	1	(1 = Degree holder, 0 = no college degree)
Experience	0	
Predicted Annual Earnings	$18,257.51	

Salary schedule based on beginning teacher characteristics assumed above and experience/educatic. adjustments for competitiveness with nonteaching occupations.

Table 6 (continued)

Years of Experience	B.A. Only	B.A.+1	B.A.+2	B.A.+3	B.A.+4
0	$18,257.51	$18,762.32	$19,281.09	$19,814.20	$20,362.05
1	$18,833.91	$19,354.65	$19,889.79	$20,439.73	$21,004.88
2	$19,406.55	$19,943.13	$20,494.55	$21,061.21	$21,643.54
3	$19,974.03	$20,526.30	$21,093.84	$21,677.07	$22,276.42
4	$20,534.88	$21,102.66	$21,686.13	$22,285.74	$22,901.93
5	$21,087.64	$21,670.70	$22,269.88	$22,885.63	$23,518.40
6	$21,630.83	$22,228.90	$22,843.52	$23,475.13	$24,124.20
7	$22,162.94	$22,775.73	$23,405.47	$24,052.61	$24,717.65
8	$22,682.51	$23,309.66	$23,954.16	$24,616.48	$25,297.11
9	$23,188.03	$23,829.17	$24,488.03	$25,165.11	$25,860.90
10	$23,678.06	$24,332.74	$25,005.52	$25,696.91	$26,407.41
11	$24,151.13	$24,818.89	$25,505.12	$26,210.32	$26,935.02
12	$24,605.83	$25,286.17	$25,985.32	$26,703.79	$27,442.13
13	$25,040.79	$25,733.15	$26,444.66	$27,175.83	$27,927.23
14	$25,454.66	$26,158.46	$26,881.72	$27,624.99	$28,388.80
15	$25,846.14	$26,560.77	$27,295.16	$28,049.85	$28,825.41
20	$27,426.91	$28,185.25	$28,964.55	$29,765.40	$30,588.40
25	$28,293.70	$29,076.00	$29,879.94	$30,706.10	$31,555.10
30	$28,374.89	$29,159.44	$29,965.68	$30,794.21	$31,645.65
35	$27,663.70	$28,428.59	$29,214.62	$30,022.38	$30,852.48
40	$26,219.11	$26,944.06	$27,689.04	$28,454.63	$29,241.38

The results of this analysis show that current teacher pay levels are indeed below levels that may be necessary to compete with other occupations. The degree of adjustment in salary needed to make teacher pay comparable to other occupations depends on the type of teacher work force that policy makers wish to attract and the evaluation of the worth of nonpecuniary benefits of the teaching occupation in comparison to others. This analysis has suggested specific dollar ranges within which competitive teacher salaries might lie. The suggested starting salary range that emerged was $13,418 to $18,257. To be effective in attracting quality entrants, it is this author's judgment that the level chosen should be toward the upper end of that range--$18,257. The average salary range suggested by the analysis was $17,793 to $23,889. Again, the upper end of the range would be recommended for an aggressive policy to improve the attractiveness of the teaching occupation. The top of the career salary scale range presented was $21,491 to $29,241. The salary scale analysis, as shown in Tables 5 and 6, indicates a real need for salary scales to include a steep gradient for experience and education in order to be competitive with other occupations.

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